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Official Records

Committee on the Peaceful Uses of Outer Space

400th Meeting
Friday, 10 June 1994, 10 a.m.
Vienna

Chairman: Mr. Hohenfellner . . . . . (Austria)

In the absence of the Chairman, Mr. Forna (Romania), Vice-Chairman, took the Chair.

The meeting was called to order at 10.25 a.m.

Report of the Scientific and Technical Subcommittee on the work of its thirty-first session (A/AC.105/571) *(continued)*

Implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space *(continued)*

Mr. Lessard (Canada): It is a pleasure for my delegation to address the important topic relating to agenda item 5. At the last session of the Scientific and Technical Subcommittee, the Working Group of the Whole studying this item proposed some conclusions on the further implementation of the recommendations of UNISPACE 2 and on the future work of the secretariat, and these conclusions were adopted by the Scientific and Technical Subcommittee in its report. Canada agrees with this result, and my delegation would like to add its voice to that of other delegations in thanking the Director, the Expert on Space Applications and the staff of the Office for Outer Space Affairs for their impressive work in the context of the United Nations Programme on Space Applications.

My delegation would like to take a few moments to highlight some recent examples of Canadian cooperative initiatives with other nations, including developing countries, involving applications of space technology in furtherance of the recommendations of the UNISPACE 2 Conference.

In the field of distance learning via satellite, I would like to mention the ongoing activities of the Télé-Université centre at the Université du Québec, which involved such projects as the creation of training courses in cooperation with Argentine institutions and the transmission of the information through two-way video and voice teleconferencing. I might also mention the activities of the Telemedecine Centre at Memorial University in Newfoundland, which has been involved for over two decades in research on the use of interactive communications technologies to supplement health and education services in remote areas of Canada and in several other countries, such as Kenya and the Philippines. Still in the field of telecommunications, reference can be made to the provision by the Canadian International Development Agency in recent years of domestic INTELSAT receiving stations as well as some training to such countries as Peru and Mozambique.

In the field of Earth observation, Canadian aid and research agencies continue to seek new joint-applications development and technology-transfer programmes with developing countries, particularly in order to realize the economic and environmental benefits we hope to achieve with our RADARSAT Earth observation satellite, scheduled for launch in early 1995.

Canadian assistance activities, undertaken through both the Canadian International Development Agency and the International Development Research Centre, with the active participation of the Canada Centre for Remote Sensing, have contributed to remote sensing on all continents, involving such countries as Brazil, Burkina Faso, Cameroon, the People's Republic of China, Costa Rica,

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Egypt, Indonesia, Jordan, Peru, Malaysia, Mali, Thailand and Viet Nam. Project activities involve, for example, the provision of early assistance in the development of satellite receiving stations, such as the LANDSAT TM station in Thailand. Canada's many universities, technical schools, private companies and individuals provide experts and technicians in many developing countries with education and practical hands-on training in the use of remote-sensing products and services. Canadian industry participates directly in the establishment of domestic commercial capabilities through joint ventures and partnerships.

In 1993 Canada, through the Canada Centre for Remote Sensing and in cooperation with the Canadian Space Agency, the International Development Research Centre and the private company Radarsat International Inc., began a global airborne synthetic aperture radar programme, called GlobeSAR 1993, involving countries in the Middle East, Africa and the Asia-Pacific region. This project, which was designed to demonstrate the capabilities of the future RADARSAT satellite, was a follow-on to the 1992 ESA-sponsored SAREX airborne radar mission to South and Central America. The approach is to organize workshops designed to inform the local remote sensing communities of the nature of the GlobeSAR project, and the goal is eventually to have developing countries define their own resource management and research priorities and to jointly develop methods to apply the resulting information for policy development and management decision-making, while helping to develop a local capacity in radar remote sensing. The Canada Centre for Remote Sensing and other Canadian and international agencies are now in the final stages of preparation for a new phase of the GlobeSAR programme, which will focus once more on South America and which will likely be launched this year.

In conclusion, I should like to say that Canada fully recognizes the important role which space technologies can play in promoting sustainable economic and social development in many regions. This explains the active involvement of Canada in the relevant working groups of the Space Agency Forum as well as of ESA to study precisely this question. We believe that enhanced international cooperation, where possible and appropriate, can go a long way towards realizing those benefits.

Mr. Galazka (Poland): We would like to express our satisfaction that the subject of space debris was a separate agenda item at the thirty-first session of the Scientific and Technical Subcommittee. Together with many other delegations, we had been advocating this item's inclusion for several years. We share and support the opinion expressed here by the Netherlands and Canada that space debris is a very important problem, but it is only one of the problems of the outer space environment and others are still awaiting consideration.

As regards UNISPACE 3, one agenda item should be the general problem of protecting and preserving the outer space environment, and not only the issue of space debris. We also support the idea, first expressed by the Netherlands, that a deadline should be set for the final report on space debris. In addition, cooperation on this issue with international organizations such as COSPAR and the IAF, as well as the Conference on Disarmament in Geneva, is imperative.

We share the opinion that every country should have free access to the geostationary orbit. Realizing, however, the unique character of that orbit, we would like to propose that our Committee make an official recommendation stating that all users of the geostationary orbit should remove their space objects from the orbit after their work is completed. Removing non-functional satellites is currently the general practice of the geostationary orbit's users; however, an official recommendation by COPUOS is, in our opinion, required. If such a recommendation is adopted, the Scientific and Technical Subcommittee should define the minimum distance of the removed space objects from the orbit, because from a mathematical point of view alone the orbit has no width. We believe this is just one step forward in the consideration of space debris and the question of the geostationary orbit.

Ms. Zheng Lizhong (China) *(interpretation from Chinese):* Allow me at the outset to express my gratitude to our Chairman for chairing this session and to the secretariat for the work it has accomplished.

The Chinese delegation considers that during the past year the Scientific and Technical Subcommittee has made positive progress and achieved fruitful results at its thirty-first session. We should like to express our appreciation for this and hope that you, Sir, will convey our sentiments to its Chairman, Professor Carver.

As the world economy grows more prosperous and social development progresses, the needs of the international community in the area of the utilization of outer space are also continually increasing. Since UNISPACE 2 in 1982, countries throughout the world and the relevant United Nations organizations have made long-term, tireless efforts towards the peaceful use and exploration of outer space through the implementation of

the United Nations Programme on Space Applications. China highly values the achievements of the relevant United Nations bodies in pushing forward this Programme.

During 1993 the Programme's implementation involved a multiplicity of activities, such as in-depth training, long-term research, technology advisory services, training courses, workshops, symposia and so on. Three training courses, three workshops and two regional conferences were organized, covering synthetic aperture radar (SAR) applications, data image processing, disaster prevention, remote sensing education and space communications. Furthermore, 11 series of activities are to be launched in 1994. They include the utilization of space technology to strengthen socio-economic and environmental security.

The Chinese Government has always supported and actively encouraged the implementation of the Programme on Space Applications which we believe, will have a positive effect on consolidating exchanges in the field of space science and technology, and in particular on the effective sharing of results and the collection of experience aimed at benefiting developing countries and promoting social progress. During the period 1993-1994 China provided four one-year fellowships to this Programme.

The Chinese delegation avails itself of this occasion to announce that during the period 1994-1995 the Chinese Government will provide further support to the Programme in the following two main areas. First, in 1994 China will contribute another two one-year fellowships for developing countries covering training in remote sensing, cartography and satellite geodesy. Secondly, from 14 to 18 September 1994 China will host and jointly organize, with the European Space Agency, the United Nations Office for Outer Space Affairs and other United Nations bodies, an international Training Workshop on Microwave Remote Sensing Applications to promote the widespread application of this new technology. China is to supply the conference facilities as well as local travel expenses, together with board and lodging, for representatives from 20 developing countries.

At the same time, the Ministerial Conference on Space Applications for Development in the Economic and Social Commission for Asia and the Pacific (ESCAP) Region will be held in Beijing, China, from 19 to 24 September 1994. This will constitute an important activity in the implementation of the relevant United Nations recommendations from UNISPACE 2 as well as a significant event in the world of space applications. The Chinese delegation will separately give information regarding this conference. We shall welcome friends coming to Beijing to attend this conference, which we hope will achieve historic results.

The selection of "Space applications for disaster prevention, warning, mitigation and relief" as a theme for special attention by the Scientific and Technical Subcommittee at its 1994 session was an apt one. At present, the sudden eruption of natural disasters poses an enormous threat to the survival of mankind. China suffers annual losses amounting to several hundred million yuan due to such causes, and the Chinese Government attaches great importance to the utilization of advanced space technology to monitor, give warning, and evaluate relief needs in case of disaster. Short-term warning of impending earthquakes is an exceedingly difficult task. In recent years Chinese experts have achieved notable results by combining satellite remote sensing of infrared thermal anomalies with other technologies to explore and forecast imminent and approaching seismic events. Since 1990, 32 warnings have been issued, with results that give reason for optimism.

Recently China has been utilizing space and aeronautic remote sensing, including satellite and on-board synthetic aperture radar in combination with satellite communications, geographical information systems, the global satellite positioning system (GPS) and other advanced techniques to set up a national real-time monitoring and evaluation system of remote sensing for natural disasters. The branch system of on-board remote sensing real-time imaging propagation has been established, in-flight trials and adjustment of the entire system are at present under way; the system will be in full operation this year during the flood season.

As regards applications of satellite positioning techniques, GPS technology was successfully applied in the outskirts of Beijing last May to aeroplane utilization for the prevention of crop disease and insect pests over large areas.

At the invitation of the Office for Outer Space Affairs, Chinese specialists presented to the thirty-first session of the Scientific and Technical Subcommittee a technical report entitled "Monitoring desertification changes in China".

Sudden natural disasters constitute one of the gravest problems now besetting humanity. We must continue to make use of already-mastered advanced technologies to mitigate the damage caused by disasters.

The adoption of "Application of space technology for education with particular focus on its use in developing countries" as the theme for special attention at the 1995 session of the Scientific and Technical Subcommittee was a most necessary choice. China is actively striving to serve as host to the Asia-Pacific regional centre for space science and technology education, and has already started building preparations at the renowned Beijing University and the Wuhan Cartography Science and Technology University. Last May we had the honour of receiving in Beijing a group of experts sent by the United Nations to evaluate the project. We are ready to contribute our available resources and experience to develop regional education in space science and technology.

Remote sensing of the Earth by satellites, including, *inter alia*, applications for developing countries, is an extremely important matter. Considering that the remote sensing system is of particular value to environmental monitoring, resource investigation and disaster warning and evaluation, it is necessary to lay particular emphasis on compatibility between existing remote sensing satellites and future systems, together with their complementarity and continuity in data collection. At present, the price of satellite documentation is extremely high, seriously hindering widespread application in developing countries. The importance of supplying remote sensing data and analysis material openly, at a reasonable price and in a timely manner to all countries should be stressed. We agree to maintain the item on remote sensing of the Earth by satellites, including, *inter alia*, applications for developing countries, on the agenda, to be reviewed as a priority item at the next session.

The Chinese Government is greatly concerned with the issue of reducing debris generated by space activities. Outer space is a resource that is a part of the common heritage of mankind; its protection is our shared duty. While paying close attention to research and development trends on the international scene, the relevant Chinese institutions are also organizing Chinese specialists to develop effective research in this field. Their work currently involves mathematical-model research on space debris, the study of ways of reducing space debris and observation of debris production occurring through the launching of space objects by China and other countries. The Chinese Government supports continued research by experts in this field. We also endorse continued review of this agenda item by the Scientific and Technical Subcommittee.

The year 1994 witnessed the further development of China's space technology. We have successfully launched the SJ-4 scientific experimental satellite, and later this year will launch three international satellites - APSTAR 1, APSTAR 2 and OPTOS B-3 - and China's DFH-3 telecommunications satellite.

The components of China's fundamental policy of space technology development are strengthening international cooperation in science and technology on the basis of equality and mutual benefit, and the common exploitation and peaceful utilization of outer space. We hope to see the further expansion of such international cooperation under the impetus of the Programme on Space Applications.

Finally, I wish to express my appreciation for the efforts of Mr. Jasentuliyana, Director of the Office for Outer Space Affairs, and Mr. Abiodun, the Expert on Space Applications, to promote the Programme on Space Applications. I also thank the secretariat for the work it has done. We are convinced that under the Chairman's able leadership, and with the collective wisdom of all participants, this session will come to a successful conclusion.

Mr. Moutsoulas (Greece): My delegation congratulates you, Sir, upon your election to a vice-chairmanship of this Committee.

My delegation wishes to commend the Scientific and Technical Subcommittee for the work performed during its thirty-first session. Moreover, I should express my delegation's appreciation for the outstanding work which has been carried out by the Director of the Office for Outer Space Affairs, Mr. Jasentuliyana, and the Office's staff, as well as to the activities of the Expert on Space Applications, Mr. Abiodun.

I notice with satisfaction the inclusion of the item on space debris in the Scientific and Technical Subcommittee's report. More than 10 years have passed since we were warned on that issue by the representative of Czechoslovakia, Mr. Perek.

Another important issue included in the report of the Scientific and Technical Subcommittee is remote sensing of the Earth by satellites, a subject that is no longer an isolated technological discipline but rather part of a system which studies systematically complex problems of the Earth's environment with the support of a vast amount of information.

In past years, problems related to the Earth's environment were split into particular disciplines and treated separately. This was due to weaknesses in computer science. Recent progress of computer technology in computing speed and storage capacity permit the interdisciplinary study of problems. Land use and planning, geological mapping, soil erosion and degradation, as well as the results of forest fires, meteorological observations and pollution monitoring are no longer treated separately. All data obtained by remote-sensing methods are deposited into appropriately developed geographical information systems and studied in combination with supplementary information. Not only are these data combined but, through existing networks, computer programmes and the corresponding solutions are feasible.

Several universities have joined forces and established a post-graduate European course in land information surveying within the framework of the Erasmus Programme of the European Economic Community. These institutions include the Remote Sensing Laboratory of the University of Athens in Greece; the Laboratory for Regional Geography and Landscape Science of the University of Ghent in Belgium; the Institute for Geography and Computer Sciences of the Roskilde University Centre in Denmark; the Département de Géographie of the Université de Limoges in France; the Departemento de Geodinamica of the Universidad de Granada in Spain; the Departamento de Geografia e Planeamento Regional de Faculdade de Ciencias Socias e Humanes of the Universidade Nove de Lisboa in Portugal; the Physics Department of University College Dublin in Ireland; and the Department of Geography of the University of Reading in the United Kingdom. I hope that from this October another good university, an Austrian university, will be added to that list. Professor Ortner's advice on that matter is much appreciated.

In addition to the Erasmus scholarships which are offered for that course, the Greek Government is offering to nationals from Africa, Asia and Latin America state scholarships for post-graduate studies in Greece. Details of these will be available at the Office for Outer Space Affairs.

The second EUMETSAT Data Collection Platform Users Conference was held at the Eugenides Foundation on 14 to 17 September 1993. Sixty participants from 11 countries and 14 international organizations and societies took part in the Conference. The Eugenides Foundation cosponsored and hosted this activity, as it did the United Nations Workshop on Space Communications for Development held in May 1993, which was mentioned in yesterday's statement of the Expert on Space Applications and is referred to in paragraph 27 of the Scientific and Technical Subcommittee's report.

Greece's National Meteorological Service recently installed a high-resolution picture transmission system. A special interdisciplinary Working Group has been established, consisting of scientists and engineers representing governmental agencies and universities, in order to promote the full exploitation of the system. The Working Group will concentrate on meteorological applications, as well as sea-pollution monitoring, forest-fire risk assessment and so on. Moreover, this Working Group is in charge of the preparatory study for the Regional Centre for Space Science and Technology Education in Europe, which will specialize in the aforementioned subjects, as Greece proposed in its statement to this Committee.

Next month we will celebrate the twenty-fifth anniversary of the Apollo 11 landing. It should be mentioned, however, that preparations for that achievement were based on wide international cooperation. To give an example, years before the exploration of the Moon by spacecraft, its mapping began with telescopic observations, at the visual as well as the infrared part of the electromagnetic spectrum, from France's Observatoire du Pic-du-Midi, with a telescope given by the United States of America for the planning and support of the Apollo missions. We are proud that Greek astronomers took part in that international effort, which was led by the late professor Zdenek Kopal of the University of Manchester in England. Another example of fruitful international cooperation was the simulation flight of the French SPOT satellite. Four years before the satellite's flight, a Daedalus scanner was flown on the aircraft of the French Institut Géographique National over Messinia, in southern Greece, and its data were analysed by Greek scientists at the Joint Research Centre of the Commission of the European Communities. Since that time, the region of Messinia has become the testing ground for several remote-sensing experiments of the European Union. Greek scientists are now looking forward to continuing their research on the spectral signatures of typical Mediterranean landcover, in cooperation with the Instituto Nacional de Tecnica Aerospacial of Spain.

While numerous space research and application activities have been conducted in the framework of bilateral agreements of cooperation with European partners, additional and better coordinated ones are expected to be

developed following next month's visit of the Director General of the European Space Agency (ESA), Mr. Luton, to Athens, about which the representative of ESA informed the Committee earlier this week.

In addition to Greece's European cooperation, and in view of the currently developing Cooperative Programme for European and United States Cooperation in Higher Education, a special programme has been initiated, with the participation of several university departments in Greece and the Carnegie Mellon University of Pittsburgh, on planning for the design of human environments. A Forum-Workshop devoted to this theme was held in Sparta in May, organized by the Sparta Institute, which is a joint venture of Greek institutions and the Carnegie Mellon University of the United States. This Forum addressed the potential for a project-based academic collaboration of scientists, engineers and artists to exploit jointly the emerging technologies and reconsider our *modus vivendi*.

What can different disciplines offer each other, and how can they benefit from each other in a cooperative workspace? Examples such as image-processing techniques - which are similarly used by geographers in space-borne remote sensing, physicians in CT scans, graphic designers in photoprocessing, robot programmers in object recognition, and so on - show that common languages develop across the sciences and arts through the use of common tools. Similarly, the fuzzy borders between geographic information systems, computer-aided design models, multimedia databases and virtual-reality productions prove that traditional distinctions inevitably fade in our rapidly and surprisingly evolving working environment.

Moreover, during that Forum, the potentialities of today's communication systems were demonstrated. The Sparta Institute was connected to the Science and Technology Library of Carnegie Mellon University through the Internet computer network and information was exchanged. It became apparent that, thanks to space communications, the knowledge and expertise of an institution of high standing is available anywhere in the world, even in the most otherwise isolated places.

That facility was originally developed in order to assist American students spending a semester of research work in Greece in keeping in touch with their home institution. It could, however, be used by any country as a model for development of a university campus of high standards, even in the most underprivileged area.

The strong belief and ideal of my country are that educational programmes should not be restricted by national boundaries. Everyone should be allowed to participate. Scientific competence and, at a global scale, a good understanding of today's problems might be an efficient way of smoothing differences and preparing the ground for a peaceful world. And, to that extent, one of the most respected universities of the world - Carnegie Mellon University of the United States - has set a good example.

Mr. Zvedre (Russian Federation) *(interpretation from Russian):* In our opinion, a retrospective review of the activities of the Scientific and Technical Subcommittee shows that a certain amount of success has been achieved on many issues. This success is due mainly to the clear structuring of our work, although its dynamic, nature, stage of advancement and rational order of planning tend to vary depending on the problem being addressed.

At the present session, it is necessary to strengthen and develop this trend and attempt to find general measures of interest and use to all. In its fullest scope, this might also involve dialogue related to the possible establishment of a new global space forum.

We feel that this is no simple matter and that we should resist dividing delegations into factions for and against it, into "progressive globalists" and skeptics who forsake the general interest. In the opinion of the Russian delegation, we must try to define the various points of view and to understand why, at its last session, the Subcommittee failed to reach a consensus on the convening of a third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE 3). For many, such a measure represents a radical way of creating new forms of integration and a good opportunity for making important progress in our apprehension of new ideas for exploiting space in the interests of humanity and enriching the practice of cooperation. To a certain extent, too, we would wish to clarify our restrained attitude to convening a new conference and to point out a few concrete realities.

We feel that it would not be entirely correct at the present stage to assert that there is an absolute need to convene such a conference. One reason is that the guidelines for cooperation established by the previous Conference remain relevant today. Systematizing experience, developing the practice of cooperation and making timely and justified corrections to the guidelines can be done within the framework of the Committee. Thus, before convening such a large-scale forum, it is important

carefully to consider the possible ways and means to achieve the desired goals. Moreover, in principle we should define those goals that would be of interest to all the States concerned. Similarly obvious is the need to take into account the practical, global and legal aspects of problems that need to be addressed by any world space conference. In circumstances in which constructive work is being carried out within the Committee on many of those issues, the exacerbated emotions of the moment, elicited as a result of unreasonably high hopes for such an international forum, could significantly hamper the constructive tone of the Committee's work.

In the context of the constructive dialogue taking place in the Legal Subcommittee, it would be logical to appraise the results of its serious reconsideration of principles by taking into account interrelationships in the sphere of cooperation in order to assess the extent to which they can be adapted to the criteria and requirements of contemporary life. Such work would enable us to define with greater clarity the possible institutional characteristics and parameters of new ideas for international cooperation and its renewed priorities.

Our delegation would like to apprise the Committee of Russia's hopes to reactivate its space activities and its participation in space affairs in the coming years, especially through the United Nations Office for Outer Space Affairs and the Programme for Space Applications, by renewing our practice of participating in cooperative measures at the national level. In recent years, this participation has been somewhat curtailed by radical changes in the structure of our national management of space activities and our need to devote priority attention to reforms taking place in Russia's space industry.

The Russian delegation would like briefly to describe the current status of problems in nuclear safety and the radiation security of nuclear-power sources (NPS). We have had considerable experience in the utilization and development, first, of radiation-safety systems for reactor units in low Earth orbit and in the aerodynamic and explosive dispersion aspects of these units and, secondly, in other special elements in the construction of radio-isotopes for nuclear-power sources, ensuring radiation safety for all apparatuses in normal operational circumstances and in case of accident.

We now have a certain amount of understanding of safety questions, and the consequences of a possible collision of NPS with space debris, if such nuclear sources are located in space apparatus in long-term low orbit, or after the decommissioning of high-orbit apparatus. In view of the importance of publishing the results of research on safety questions relating to NPS, Russia is prepared to make available the relevant information and analysis materials on various aspects of the NPS problem to the Subcommittees.

Moreover, promising systems are being developed that would guarantee nuclear and radiation safety in the event of an accident involving NPS reactors.

In Russia we have found fairly acceptable technical solutions to the problem of ensuring the safety of NPS in space. These have been derived by the relevant sections of the Atomic Energy Ministry and the manufacturers of the systems. The further development of work along those lines should lead to an expansion of the range of NPS available and also in the choice of optimum solutions to safety problems.

The programme of work of safety problems takes into account the development of ways and means of ensuring the safety of NPS of different types: for supplying power to the apparatus of space vehicles, electrical reactors and nuclear-powered rocket engines. The aim of such development projects is the eventual harmonization of unified NPS safety systems that could meet the above-mentioned requirements at every stage of operation, including accidents encountered while entering orbit or being taken on board, or caused by collisions with space debris.

The Russian Atomic Energy Ministry, together with the United States energy authorities, has considered the standard-setting and technical documentation available in both countries to regulate the safety of NPS in outer space and to develop proposals to synthesize them.

The results of these developments will become apparent in the next few years, enabling us to go on to the discussion of proposals to review the principles governing the use of NPS and the formulation of new norms and standards and the revision and expansion of existing provisions. The delegation of the Russian Federation feels that bringing these principles together, as well as the IAEA document on extraordinary planning and preparation for the return of a satellite with a nuclear unit, which should be published towards the end of 1994, would be entirely adequate at this time, in the almost complete absence of NPS launchings. As to the energy sources already launched and in orbit at 800-1,000 kilometres, the consequences of any possible collision with space debris are

also being studied. The results of our research fully confirm the safe outcome of any such event, as well as the remoteness of the possibility of accident. Within the framework of existing research on safety, we intend to analyse the space measures in force at the moment in order to remove from orbit any unsatisfactory NPS or to raise them to a higher orbit if necessary.

We welcome the fact that the Scientific and Technical Subcommittee has begun consideration of the problem of space debris and is studying ways of solving this problem on the basis of international cooperation, as well as seeking ways to continue research into this matter. The range of problems to be considered is extensive. It includes the observation and modelling of the formation and growth of pollution "clouds" in space and research into and determination of criteria and rational models of conduct in space, the systematization of ways and means of averting the worsening of pollution and ensuring the safety of space objects, as well as finding ways to lower the level of pollution.

In order to ensure an exchange of views on this matter, assessment of progress in problem solving and the quest for mutually acceptable measures to encourage the international community to resolve the problem of space debris, it would be useful if the results of the international interagency coordinating committee on the problem of space debris were presented to a session of the Scientific and Technical Subcommittee in synthesized form within the framework of special academic seminars. As to the matter of speeding up the international and legal settlement of these problems, we believe this would be premature without sufficient development of their scientific and technical aspects.

Mr. Suárez (Mexico) *(interpretation from Spanish)*: The report on the work of the Scientific and Technical Subcommittee at its thirty-first session (A/AC.105/571) reflects the status of the most important items covered during that session. My delegation believes, however, that in future the Subcommittee should submit reports that are more transparent rather than follow its traditional practice of indicating only the results of the debate or that there was opposition to some points, without specifying how the majority view in the Subcommittee might have changed. We believe that the current format - indicating only that no agreement was reached - favours pro forma statements while offering no incentive for negotiating processes that might result in substantive progress on points of common interest.

With respect to the substantive aspects of the report, my delegation reiterates its unwavering commitment to strengthening international cooperation in outer space. In this respect, it expresses once again its deep concern at the increasing imbalance in the various United Nations activities in this field and also at the meagre resources available to the United Nations Programme on Space Applications for experts from developing countries.

My delegation is very pleased to note that, in conformity with General Assembly resolution 48/39, the Scientific and Technical Subcommittee included the question of space debris on the agenda of its last session. The Subcommittee thus began consideration of its new item and considered the question of scientific research on space debris, including relevant studies, the elaboration of mathematical models and other analytical work relating to space debris environment. The Subcommittee also agreed that international cooperation was necessary to devise appropriate and viable strategies to minimize the possible consequences of such space debris.

My delegation is of the view that in future the Subcommittee should focus its attention on collecting and analysing data on space debris environment and on devising a plan of work. We therefore renew our request that this matter be placed on the agenda of the Legal Subcommittee and stress once again that its inclusion does not mean that the Scientific and Technical Subcommittee has exhausted its consideration of the matter, because advances are constantly being made in this field.

As my delegation stated in the course of the general exchange of views, Mexico is in favour of convening a third UNISPACE conference, because this would not only certainly give renewed impetus to the implementation of the recommendations of UNISPACE 2 but would also revitalize the work of the Committee. A number of delegations have cited the need for a clear definition of the objectives of such a conference. In this respect, we feel that the proposals made by the Scientific and Technical Subcommittee, including the viewpoints expressed by the Latin American and Caribbean Group, form a good and substantive basis for making headway on the issue at the current session. In the context of the unofficial discussions to be held this evening, we believe that the topic of a third UNISPACE conference should be considered as a specific item on the programme of work so as to ensure maximum transparency in our deliberations.

The Scientific and Technical Subcommittee gave priority to undertaking an overall examination of the

question of the implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space and of the United Nations Programme on Space Applications. In this context, the Subcommittee took note in its report of activities relating to an international space information service; studies; inter-institutional cooperation; and inter-regional cooperation mechanisms.

The Mexican delegation stresses the importance of strengthening long-term training and educational efforts, as well as those that, aside from being the object of greater international cooperation, are geared to the specific requirements of developing countries. Accordingly, my delegation deems it necessary to deepen and expand the studies on the utilization of low Earth orbit satellites for communications, for managing forest resources, for space applications aimed at sustainable development and for satellite-based broadcasting systems.

Mr. Timofeev (Russian Federation) *(interpretation from Russian):* The Russian delegation has noted with satisfaction the progress achieved in the course of the Subcommittee's work during the last session. However, a number of serious and important problems still exist that will require heightened attention on our part in the future stages of our work. One of these is the question of regulating the use of the geostationary satellite orbit, the unique characteristics of which give it exceptional importance in the creation of national and international satellite communication systems for television and radio broadcasting, data transmission and so on.

The rapid increase in the number of different satellite systems in geostationary orbit, together with the latter's limited capacity, has resulted in some concern with respect to the future use of such orbits. The Russian delegation would once again emphasize that the geostationary satellite orbit, as part of outer space, can only be the common heritage of the inhabitants of Earth and must be used in strict accordance with agreements adopted by the international community.

At the same time, it should be borne in mind that over the course of more than three decades, the practical questions having to do with the scientific, technical and the international legal regulation of the use of radio frequency spectrums for various satellite systems have been handled by the United Nations specialized agencies, and in particular by the International Telecommunication Union (ITU). The ITU attaches special importance to the problem of ensuring just and equitable access to the geostationary satellite orbit by all countries, irrespective of when their satellite systems become operational.

It is no happenstance that in the new Constitution of the ITU, which goes into force on 1 July 1994, a special article - article 44 - entitled "The use of the radiofrequency spectrum and the geostationary satellite orbit", has been introduced. In paragraph 196 of this article it is stated:

> "In using frequency bands for radio communication, the members of the ITU should consider that radio frequencies and the orbits of geostationary satellites are a finite natural resource, which is to be used rationally, efficiently, and economically, in accordance with the provisions of the radio regulations, so as to ensure equitable access to this orbit and to these frequencies on the part of various countries and groups of countries, with due consideration for the special requirements of developing countries and the geographic location of various countries. The implementation of these principles is ensured by the provisions of the radio regulations, which comprise detailed rules and procedures for the use of frequencies and orbits."

Two approaches have emerged in this regard: the gradual increase in the number of systems with the implementation of international coordination of procedures - in other words, the evolutionary increase of the orbital load to meet current user requirements and needs; and the development of international a priori plans for the use of individual frequency ranges to ensure meeting coming needs of countries, irrespective of the onset time of system operations. Successful examples of such plans are, for example, the satellite TV broadcast plans for 1977 and 1983, as well as the satellite communications plans for 1988.

Both approaches have their pros and cons. However, we can note - and this is something that is based on practical results - that on the basis of collective efforts in the course of its ever so many conferences the ITU has been able to strike a balanced global approach, allowing for the meeting of everyday needs at present through international coordination procedures, and at the same time guaranteeing future access to the orbit and spectrum as inscribed in international plans.

Now given the above, and taking into consideration the fact that it is necessary at future stages of our work to continue study of the very important problems relating to the regulation of the use of the geostationary satellite orbit,

we would like to propose that there be clearer delimitation of the tasks that are taken before our Committee and before the ITU, so that there will be an avoidance of parallel work and of duplication of efforts in discussing practical proposals that have already been taken up by the international community in another forum.

Apart from this, it would probably be useful, for the purpose of progress in future discussions in our Committee, that the International Telecommunication Union, in its annual report to the Committee, also provide information on the very latest regulatory decisions, ensuring just and equitable access to the geostationary satellite orbit; this should be factored into the process of discussion, especially in our Legal Subcommittee.

The Russian delegation attaches exceptional importance to the problem of the regulation of the use of the geostationary satellite orbit and is ready to continue its active participation in resolving this problem in our Subcommittee.

The Chairman: We have concluded our joint consideration of agenda items 5 and 7.

Report of the Legal Subcommittee on the work of its thirty-third session

Mr. Lessard (Canada): My delegation has read with interest the report of the Subcommittee and is in general agreement with its description of the matters raised during the debates, as well as with the conclusions reached by the Subcommittee. I would like, however, to take a few minutes to state in more detail the Canadian position with respect to a few of the items mentioned in the report.

First, on the issue of the early review and possible revision of the principles relating to the use of nuclear power sources in space, as explained in a previous statement, Canada was very pleased that 14 years of often challenging discussions finally led, in 1992, to the adoption by the United Nations General Assembly, by way of consensus, of a set of principles on this question. Canada agrees with the continued consideration of this matter in the context of the Scientific and Technical Subcommittee, and my delegation intends to contribute to a fruitful discussion on this question at future sessions. We also believe that a comprehensive review of the principles in the Legal Subcommittee should await a sound scientific and technical basis for such review. Until such time, the integrity of the existing principles should be preserved.

With respect to the combined topics of the definition and delimitation of outer space, as well as of the character and utilization of the geostationary orbit and its rational and equitable use, my delegation tends to agree with the prior comments of the delegation of the Czech Republic that these two issues are not inevitably and obviously related and therefore do not need to be considered together. Beyond this initial remark, we note that the issue of the definition of outer space has been discussed by the Legal Subcommittee for many years, without measurable progress towards a common understanding. We believe that a precise delimitation has not proven essential in the context of the practice of States up to now, and we suggest that a concrete demonstration of the need in the future for such a delimitation, in the context of new technologies or space systems, is required. In the absence of a rejuvenated and reoriented debate on this matter resulting from such a demonstration, my delegation believes that minimal or no time should be allocated to this particular issue at future sessions.

As concerns the geostationary orbit, our position, as expressed in a prior statement, is that this matter is appropriately dealt with in the context of the International Telecommunication Union, with specific reference to the relevant sections of the ITU Constitution and Convention, and specifically, as mentioned by the previous speaker, article 44 of the ITU Constitution, which mentions the need for all states to use the geostationary orbit rationally, efficiently, and economically, guaranteeing equitable access to all. We also believe that claims of State rights to the geostationary orbit on the basis of geographical location are not allowed under international space law, with specific reference to article II of the 1967 Outer Space Treaty.

Let us now consider the topic of the legal aspects of the principle that the exploration and use of outer space should be carried out for the benefit and in the interests of all States, with particular reference to the needs of developing countries. Canada finds itself in full agreement with this principle, which was codified in the Outer Space Treaty and prior resolutions of the General Assembly, and which was further elaborated in other international instruments. My delegation believes that the most effective way to achieve this end is for States to de facto implement international space cooperation to the widest possible extent. The principle of international cooperation is a basic tenet of the Canadian space programme, as so much of what we do is based on cooperative efforts. This is true also of our longstanding and fruitful activities in cooperation with many developing countries, as illustrated by my earlier statement today, which provided several

examples of such collaborative projects in the fields of telecommunications and remote sensing. We believe this approach offers the best flexibility in terms of responding to the abilities of some States and the needs of others, and does not make it necessary to formalize the terms of the cooperation.

Finally, let me say a few words on space debris. As noted before, Canada was heartened by the progress made at the Scientific and Technical Subcommittee in obtaining consensus on the future development of a specific and deliberate multi-year work plan. We intend to contribute to this exercise and believe that sufficient, albeit limited, time should be allowed for this effort, along with other national and international efforts, sufficiently to fill the gaps in the existing scientific and technical knowledge about the environment, risks and possible remedial measures associated with space debris, including a cost-benefit analysis. Until such time, we believe it is premature for a formal discussion on this item to begin in the Legal Subcommittee.

Mr. Chandrasekhar (India): Ever since the beginning of the space age, activities related to the exploration and peaceful use of outer space have been progressing at a rapid pace. Progressively, more and more countries depend upon the use of outer space in seeking a rapid solution to their problems in telecommunications, natural resources management, environmental monitoring and several other needs. International cooperation in all these activities assumes great importance, due to the very nature of activities in outer space, in terms of their technological, economic, legal and spatial dimensions. The various treaties evolved by our Committee through the Legal Subcommittee in the past form an important foundation for supporting, guiding, and regulating the activities of various States in this field, and also for promoting international cooperation. As space technology is continuously developing and uses of outer space are diversifying, it is important to pursue further development of space law by building upon the strong foundation laid in the past.

In the opinion of our delegation, several areas merit consideration for the further elaboration and extension of international space law. These include, for example, specific measures for preservation of the space environment; elaboration of principles to facilitate equitable use of space resources, including measures for their conservation to be used by future generations; and international principles for trade and transfer of technological and material resources pertaining to peaceful uses of outer space. Other developments in international space law are also needed, particularly to reconcile the rapid developments in space applications with the security and sovereignty concerns of States. The delimitation of outer space and the principles for dissemination of very high-resolution data and information gathered from aerospace systems are examples. As our experience demonstrates, the lead times for evolving international legal frameworks are very long, and it would be appropriate for the Committee to consider appropriate studies and exchanges of information relating to such potential agenda items.

Let me now revert to the work of the Legal Subcommittee at its thirty-third session. Our delegation is pleased to note, on the positive side, a further useful exchange of views among various delegations. Given the complexity of various items that are being dealt with in the Subcommittee, progress has been slow. However, our delegation hopes to see speedier progress.

On the question related to the revision of Principles guiding the use of nuclear power sources in outer space, our delegation notes that the relevant working group in the Legal Subcommittee recommended the suspension of its work during 1995, pending the results of the work of the Scientific and Technical Subcommittee. Our delegation would like to reiterate that the Principles already adopted by consensus in the General Assembly should be implemented until such time as revisions are agreed upon. We believe that the clear scope of revisions should be agreed upon before we actually take up the revisions. In the opinion of our delegation, reviews or revisions should be essentially to bring the Principles into line with the evolution of relevant international standards such as the ICRP guidelines, which were used as a basis to evolve the criteria for safe use. The revisions should be geared towards the goal of strengthening the level of safety provided by the Principles.

Turning to the agenda item related to the definition and delimitation of outer space and the geostationary orbit (GSO), we note that it has been under consideration for a long time but has eluded agreement in the Subcommittee. Our delegation has always considered the definition and delimitation of outer space to be necessary, taking into account the rapidity of technological development and new ways of using technology. On this subject, we welcome the efforts in the Legal Subcommittee to examine the characteristics of aerospace systems and their relation to outer space from the legal viewpoint. However, we note

that some fundamental questions remain unresolved, and we hope that they will be addressed and resolved in the future.

Our delegation also believes that progress on the subject of the GSO is important. In this respect, we were pleased to note the further productive exchange of news on the working paper submitted by the delegation of Colombia. Our delegation has always considered that the GSO is a part of outer space, and we believe there is a need to evolve further legal frameworks without prejudice to the role of the ITU in ensuring, in practice, an equitable, rational, and efficient use of the GSO, taking into account the needs of all States, particularly those that have had no access so far or that have greater development needs still to be fulfilled. We hope to see further progress on this question.

With regard to the item on outer space benefits, our delegation notes with satisfaction that there have been useful exchanges of views, positions, and concerns by various delegations. In relation to this item, we would like to stress two points. We attach great importance to the principles declared in the Outer Space Treaty that outer space is the province of all mankind and that the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development. Hence, we attach great importance to ensuring unhindered access to international cooperation on the peaceful uses of outer space.

Secondly, international measures to encourage and assist the development of indigenous capabilities for implementing space applications for peaceful and beneficial uses should be recognized, because the effective implementation of space applications depends on an appropriate degree of indigenous technological skills. The development of indigenous capabilities is necessary in many developing countries to serve their interests through appropriate use of technology to meet their particular needs and priorities, maintaining the continuity of services and deriving economic benefits. We hope that the various concerns and views expressed in relation to the working paper under discussion in the Legal Subcommittee are useful in further evolving a common understanding and making progress.

Finally, we wish to place on record our appreciation of the Chairmen of the three Working Groups: Mr. Franz Cede of Austria, Mr. Estanislao Zawels of Argentina, and Mr. Raimundo González of Chile for their able guidance.

Mr. El Ghernougui (Morocco) *(interpretation from Arabic):* My delegation would like at the outset to thank the Secretariat for the excellent work it has done with regard to this item. I should also like to take this opportunity to express our satisfaction with the work of the Legal Subcommittee, which will have a positive effect on the future deliberations of this Committee.

There has been very rapid evolution in outer space activities, with many developments. Space technology is improving very quickly, and this will be beneficial to mankind as we find applications to activities on Earth.

This prompts us to consider the establishment of legal structures to govern the evolution of space science. We will also be able to strike a relative balance between international law as it governs both the use of outer space and other fields. The use of nuclear power sources in outer space has two aspects. Its utilization could be beneficial in, for example, the economic, scientific and social fields; but at the same time we feel it is also fraught with danger.

Accordingly, we have to think carefully about establishing new norms and principles to deal effectively with space technology, and ponder on whether or not we need to use nuclear power sources in space. It is therefore incumbent upon us to adopt new strategies and procedures for examining other means which may be less dangerous and more effective in the achievement of our objectives as we consider whether we really need to use nuclear power sources in outer space.

Enhancing and expanding the role of space science and technology, especially when the geostationary orbit is involved, is very important in view of their positive impact on economic, social and cultural developments, especially in developing countries.

Since the geostationary orbit is a limited natural resource, we must ensure its equitable use, taking into account the present and future needs of developing countries. Hence we believe that it is important to develop a legal framework governing activities in the geostationary orbit in order to ensure its efficient and effective utilization, taking particular account of the needs and interests of all countries.

We need to cooperate in the search for new solutions that take due account of the interests of all countries, and not only those of a few. We should not venture into outer space without first considering how we can compensate countries that do not possess the technology needed to

enjoy its benefits. Of course, the developed countries, which have advanced science and technology that enables them to use outer space, derive benefits from it. It is only natural that we should ask those countries to contribute to a fund to be used to carry out development projects in the developing countries enabling them to improve their television and telephone networks. This would constitute firm evidence that we were using outer space for peaceful purposes and for the benefit of all mankind without discrimination. We would thus consolidate international cooperation, leading to new areas of cooperation in the future.

The discussions that have taken place on the legal aspects of this matter have led to some important developments. Following a number of meetings and intensive discussions, new trends have emerged and we seem to be approaching consensus. It is therefore important that we now seize the opportunity opening up from these new trends, for they point the way towards genuine consensus and an equitable agreement.

The utilization of outer space for peaceful purposes is possible only through the kind of international cooperation that takes into account the interests of all countries. Indeed, experience has shown that there can be no scientific and technological progress in the economic, social and cultural fields unless we are able to consolidate and strengthen cooperation for the benefit of all countries. For this reason, and in the light of new developments, I think it has become important that a new legal framework be established that would take into account all of these recent developments as well as the question of international cooperation.

In pursuing our objective of the peaceful utilization of outer space, we must try to reconcile divergent national interests and concerns. Therefore, the participation of the developing countries in outer space projects has taken on additional importance. An atmosphere of cooperation must be created between the developed and the developing countries, regardless of their achievements in the field of space technology.

The meeting rose at 12.05 p.m.